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the earth by periods, with a comparative review of the continents, plants, and animals, of each. An adequate review of the book would require the combined efforts of a geologist, biologist, palæontologist, physicist, astronomer, chemist, and others. The geographer-geologist ought to be recommended especially to the study of the "cycles" in earth history which the author wishes to establish. He finds that there is a regular repetition, in the history of the land, of marine transgression, mountain upheaval, vulcanism, and glaciation, *viz.*: (1) A cenozoic-mesozoic cycle: Diluvial ice age—eruptions of basalts, trachytes, phonolites—formation of the Alpine system—mesozoic transgression. (2) Young-palæozoic cycle: Permian ice age—eruptions of porphyries, etc.—formation of the Hercynian system—Devonian transgression. (3) Middle palæozoic cycle: Devonian ice age—eruption of diabases—formation of the Caledonian system—upper Silurian transgression. (4) Old Palæozoic cycle: Silurian ice age—eruption of diabases—formation of the Brazilian system—Cambrian transgression. (5) Algonkian cycle: Precambrian ice age—eruption of diabases—formation of Hebrides system—lower Algonkian transgression, etc.

These cycles seem to be proven from the Middle Devonian up, and probably for the earlier periods. Thus, the author asserts, our present knowledge of earth history is perfectly sufficient to establish rational and continuous processes of development in obedience to general laws. In spite of great changes in the arrangement of the continents on the globe there are nowhere indications of great catastrophes, only of continuous progress, not always in a straight line, indeed, but always with a positive net result in the end. One may well say, in the author's own words, that, no matter whether his theories are right or wrong, they are at least possible, and it will certainly require not a little work to improve on them.

A bibliography of 304 numbers, complete indices of authors, animals and plants, places and subjects, and 23 maps, make the book a treasury of palæo-geographic references even for those who are not particularly interested in the subject as a whole. One familiar with the problems of the profession cannot help wondering how a comparatively young German high school teacher ever found the time to write it.

MARTHA KRUG GENTHE.

**Ein unerschlossenes Kulturland.** Neuquen und Rio Negro, Argentina.

Von W. Vallentin. vi and 229 pp., and 74 Illustrations. Hermann Paetel, Berlin, 1907. M. 3.

Vallentin's book is political rather than geographical. He desires to promote the formation of German colonies among the eastern, Argentine valleys of the Andes, between the 36th and 42nd parallels, that German ideals, language and customs may be preserved out of the Fatherland as well as in it, and that another market may be made for German wares.

Dr. Vallentin rode through the southern half of the region referred to, a few years since, and devotes two-thirds of his book to a charming, readable account of this journey. His style is easy and very vivid, calling before the reader's mind the dreary eastern pampas that must be traversed before the foothills are reached, where "splendid dark foliage rises from the carpet of lighter colored grass. Out of the blue-black ravines peeps the moist green of shrub and bush, and between grey, moss-grown ledges flash the clear waters of the mountain torrent. Everywhere, in clefts and hollows, on slopes and in valleys a luxuriant

plant-world; grass, bush and tree, and far away the sober mountain giants with bluish shimmering ice-caps on their white heads, the soft snow mantle around their shoulders: truly an imposing view."

The personal element, descriptions of the rare inhabitants, the means of travel, the plants and animals are the strong features of the book. Its contribution is not new subject matter to geography. Moreno drew the picture twenty-five years ago, but this appeal to another audience is an attractive one.

The author's patriotism is intense. He sees a bit of heaven in every German farm. Not that he is blind. He bemoans his countrymen's lack of co-operation, but German faith, German industry, German cleanliness, German hospitality are words he loves to conjure with. That his aspiration for a solid German-speaking population in a foreign land should arouse fears of a "German Peril" seems to him puerile and due to the machinations of "our dear cousins across the Channel" and the North Americans. "No one in Germany has any thought of such folly. Such settlements are of course for private enterprise, the Government has nothing to do with them, at least it must never put itself to the front."

Chile still supplies the scanty population of the agricultural strip and dominates its commerce, thus repeating the history of the western provinces further north, all of them first settled from across the Andes and still closely bound to the Pacific coast by the exportation of Argentine cattle. The railroad that was just touching the eastern border of Neuquen was beginning to promise a closer intimacy with the national capital, but the rail-head was still 250 miles from Lake Nahuel Huapi, the central point in the fertile belt which is in good communication with Chile by the Perez Rosales pass. This is little more than 3,000 feet above the sea and small steamers ply on the lakes at both sides.

As yet agriculture is limited to supplying the very limited local consumption, the population is less than one to a square mile, and grazing is the only profitable business; but with the coming of the railroad this will change, for the possibilities are great. The best lands have been taken up already by Chilean, English and North American speculators and prices are rising (as high as \$4 an acre, for purely grazing lands), but a company with capital could still obtain ground at reasonable rates. The author—a captain with the Boers—fears that the English will seize all the chances and build a railroad, too.

Voss's map gives this belt less than twenty inches rain, though the higher slopes doubtless receive more and irrigation should be nowhere difficult. Within the mountain border nearly every valley has agricultural lands. The east is almost a hopeless desert which includes most of Rio Negro and perhaps half of Neuquen. There remains an area rather smaller than Switzerland, with a warmer climate but much less rain.

The illustrations are not very good and a number of them are much retouched.

MARK JEFFERSON.

**Corrasion by Gravity Streams with Applications of the Ice Flood Hypothesis.** By E. C. Andrews. Department of Mines, Sydney, N. S. Wales. Reprinted from *Journal and Proc.* of the Royal Soc. of N. S. Wales, Vol. 43, 1909, pp. 204-330, 11 figs., 3 appendices, and a bibliography.

An important paper with new conclusions relating to certain valley forms due to glaciation. The first part is devoted to theoretic considerations of stream bow and channel scour, the second to applications of principles to ice streams